

FIG.1

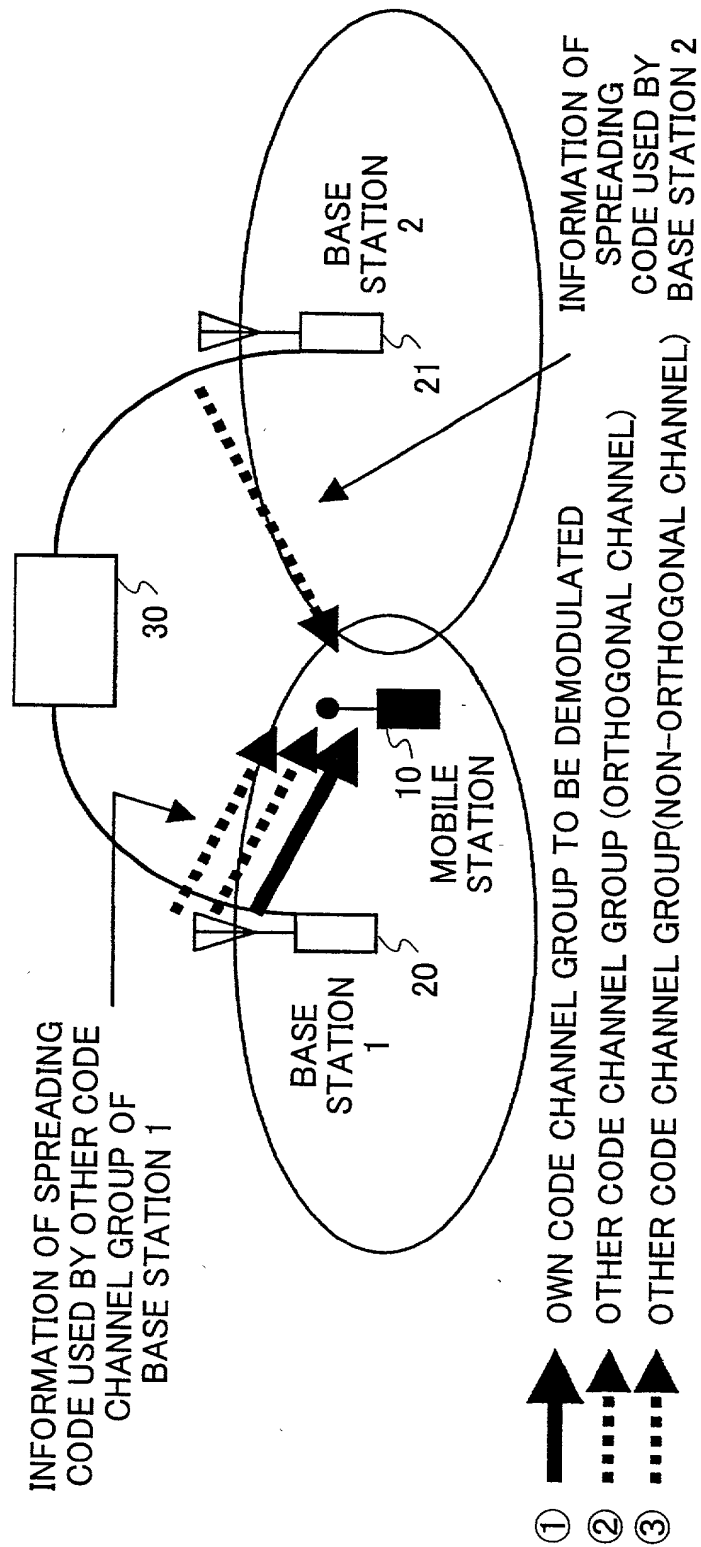


FIG.2

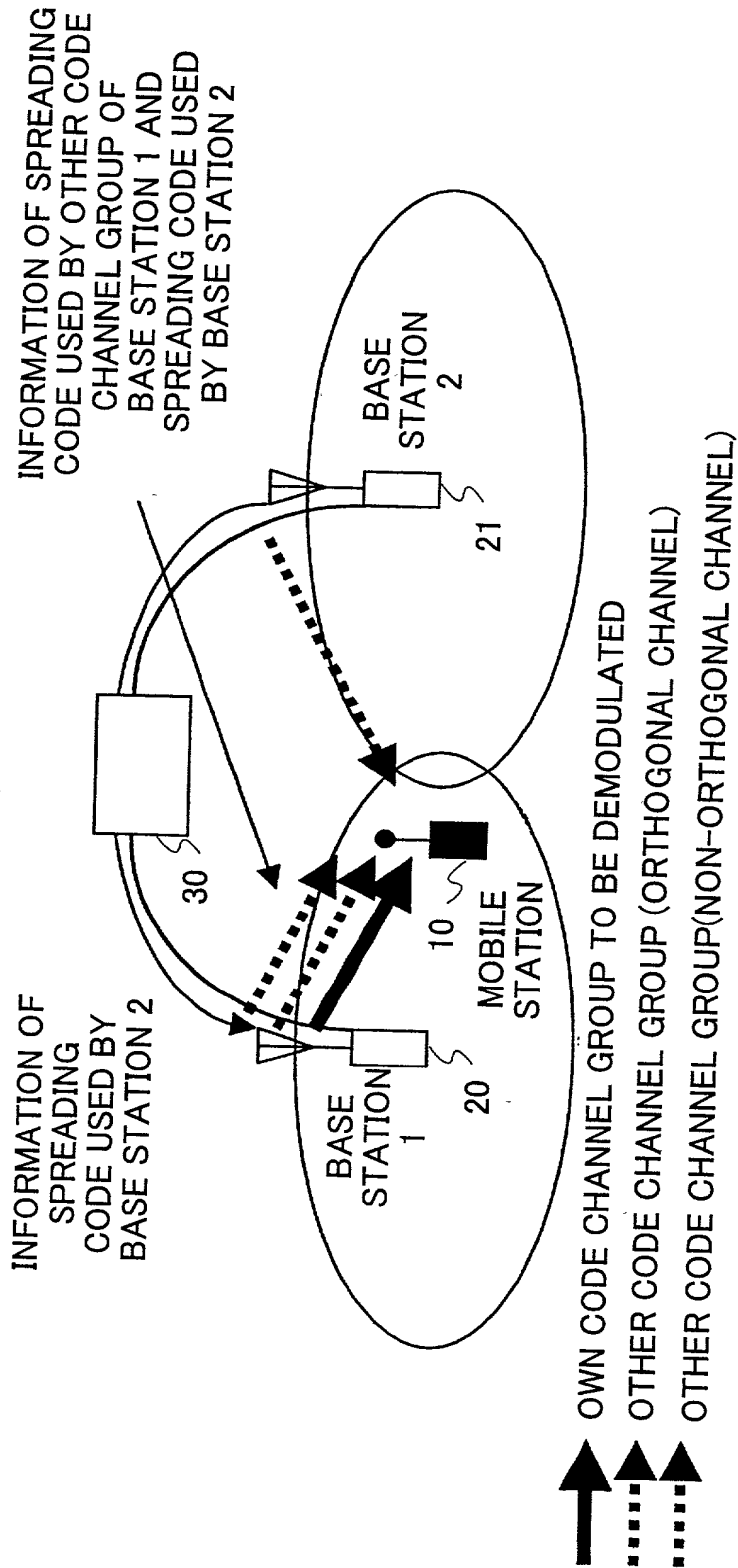


FIG.3A

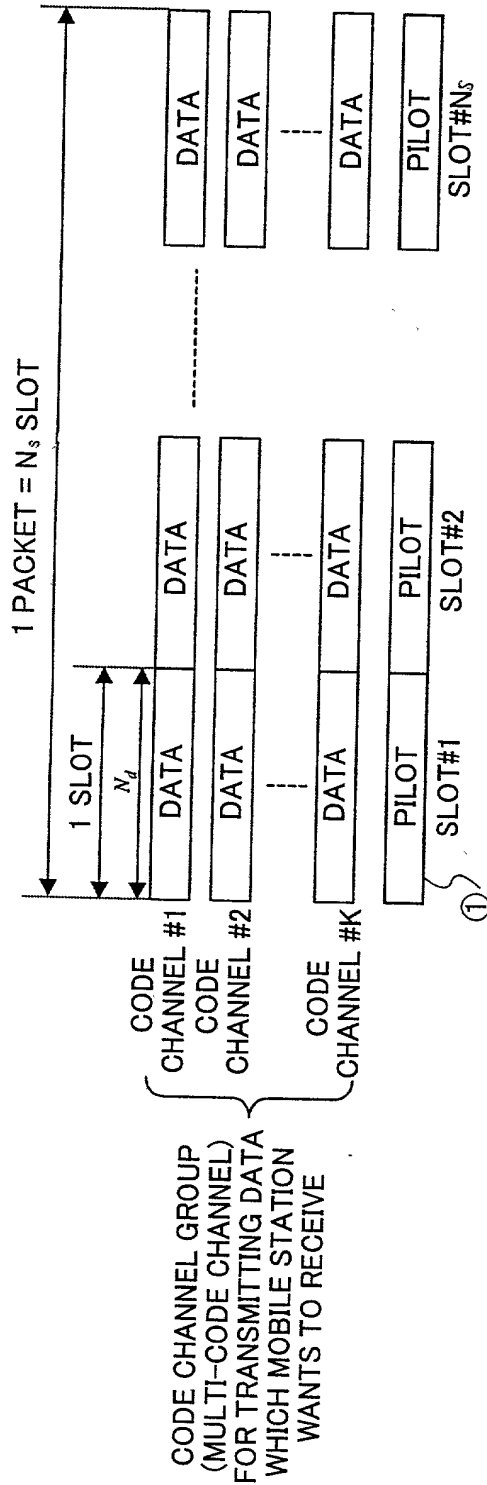


FIG.3B

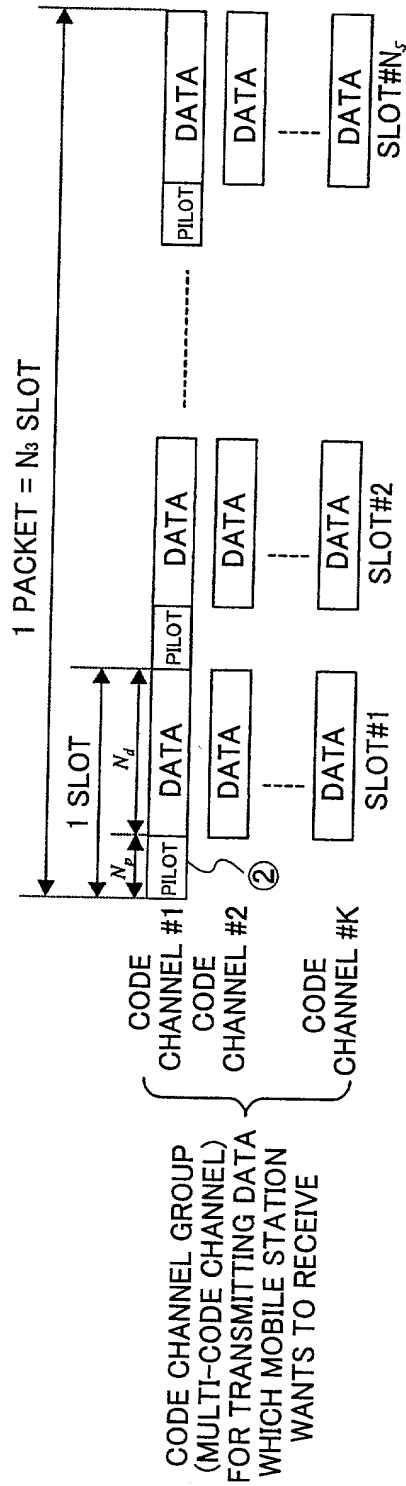
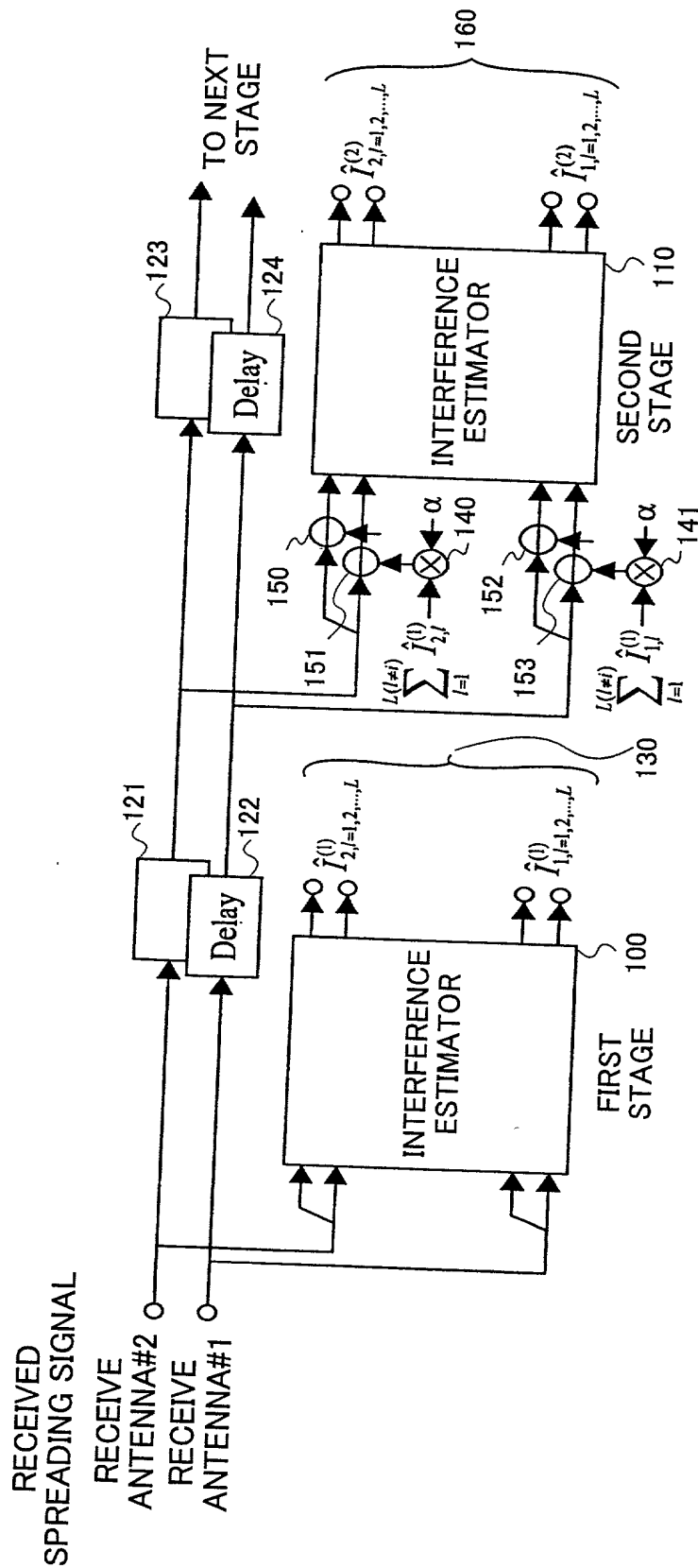


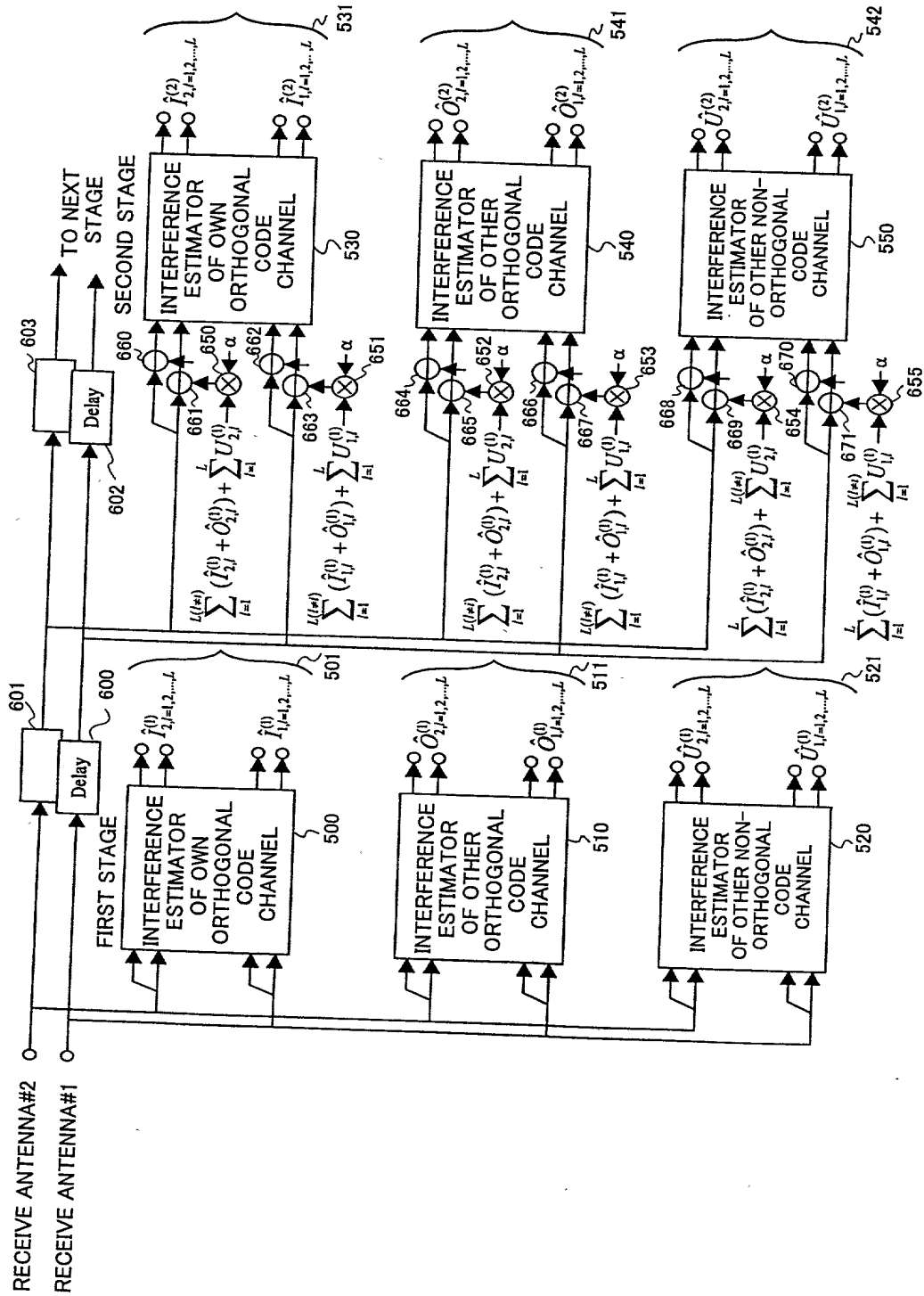
FIG.4



The diagram illustrates a multi-carrier communication system architecture. On the left, a set of antennas (400) with  $L$  elements feeds into a rake/antenna diversity combining part (210). This part consists of  $K$  parallel branches, each containing a despreading part (202) and a multiplier (204). The outputs of these multipliers are summed at a summer (205). The combined signal then passes through a P/S converter (220) and an error correction decoder (230). The decoder's output is fed back to the error correction coder (250) and also passes through a frequency converter (240) to the data modulator (260). The data modulator's output goes through an S/P converter (270) and a frequency converter (241) to a set of  $K$  parallel spreading parts (320). Each spreading part (320) includes a multiplier (324) and a spreading part (321). The outputs of these spreading parts are summed at a summer (353) to produce a signal  $\hat{I}_{2,L}^{(p)}$ . This signal is then fed into a set of  $K$  parallel channel estimators (303). Each channel estimator (303) includes a despreading part (302) and a multiplier (304). The outputs of the channel estimators are summed at a summer (360) to produce a signal  $\hat{I}_{1,L}^{(p)}$ . The channel estimators also provide feedback signals to the despreading parts (302) and multipliers (304) within each channel estimator block. The entire system is designed to handle multiple carriers and provide diversity combining and channel estimation.

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SHEET 5 OF 11

RECEIVED  
SPREADING SIGNAL  
RECEIVE ANTENNA#2  
RECEIVE ANTENNA#1



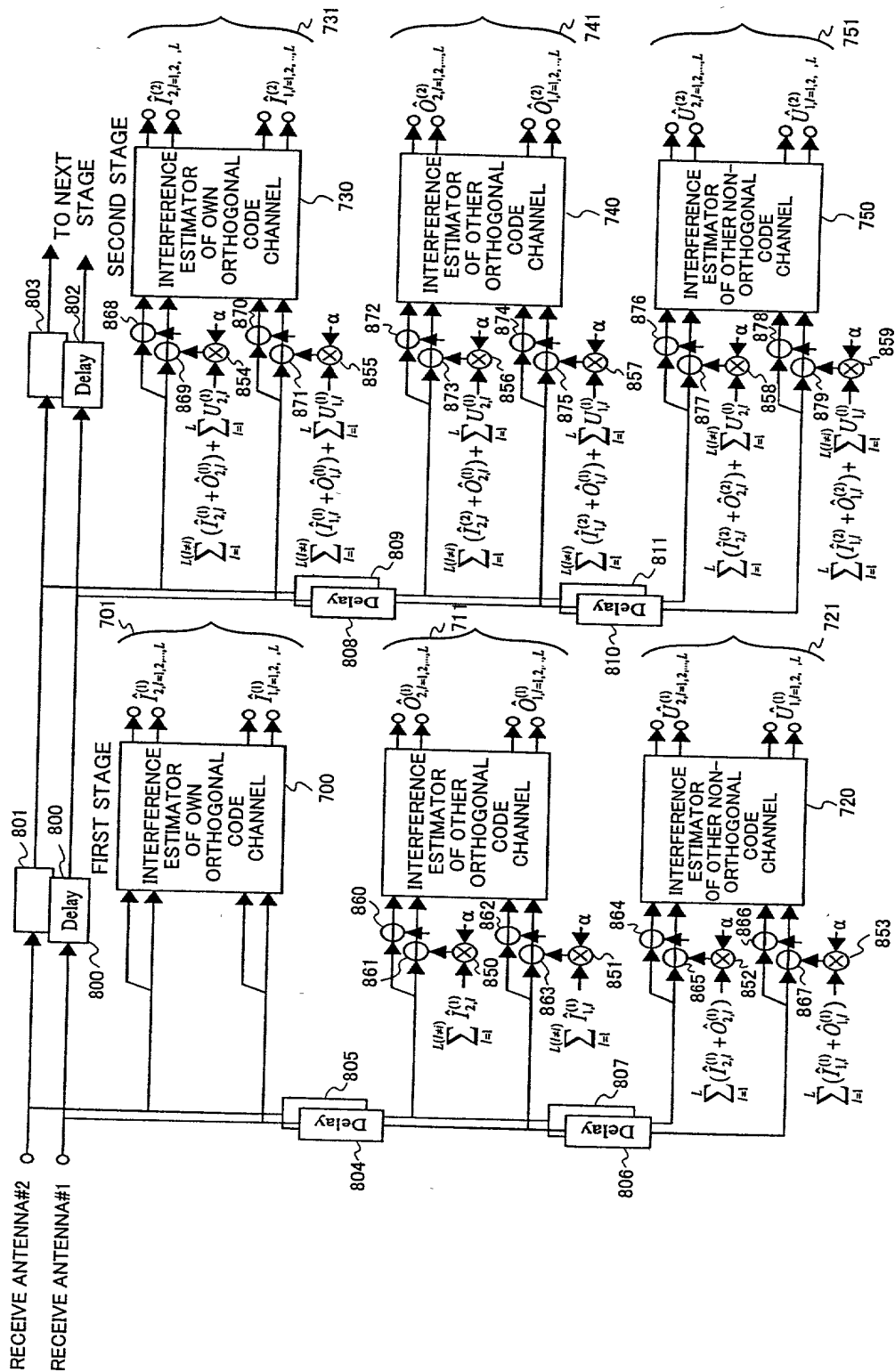
RECEIVED  
SPREADING SIGNAL

FIG. 8

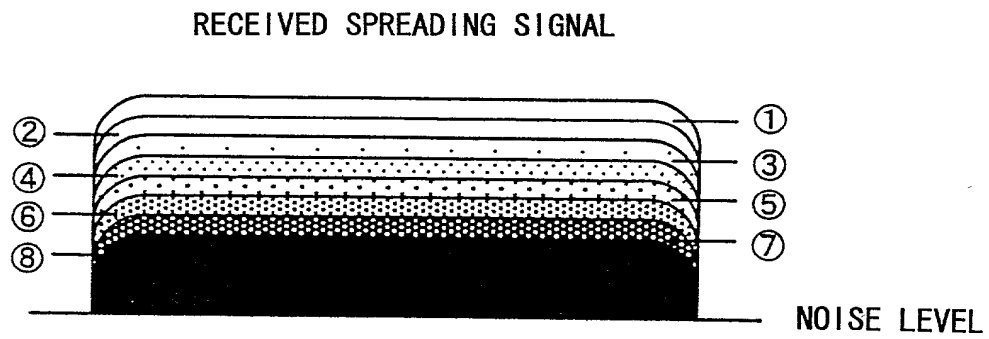




FIG. 9A

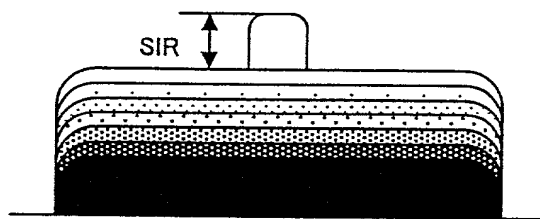


FIG. 9B

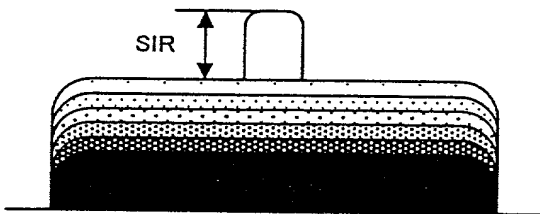


FIG. 9C

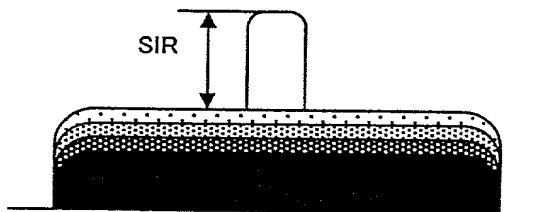


FIG. 9D

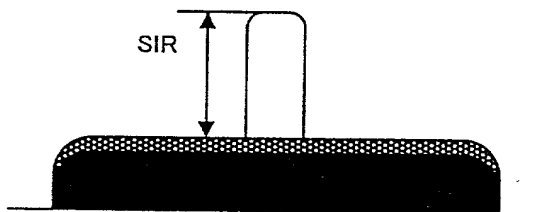


FIG. 9E

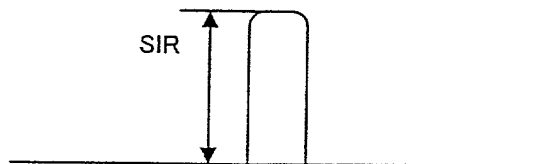


FIG. 10

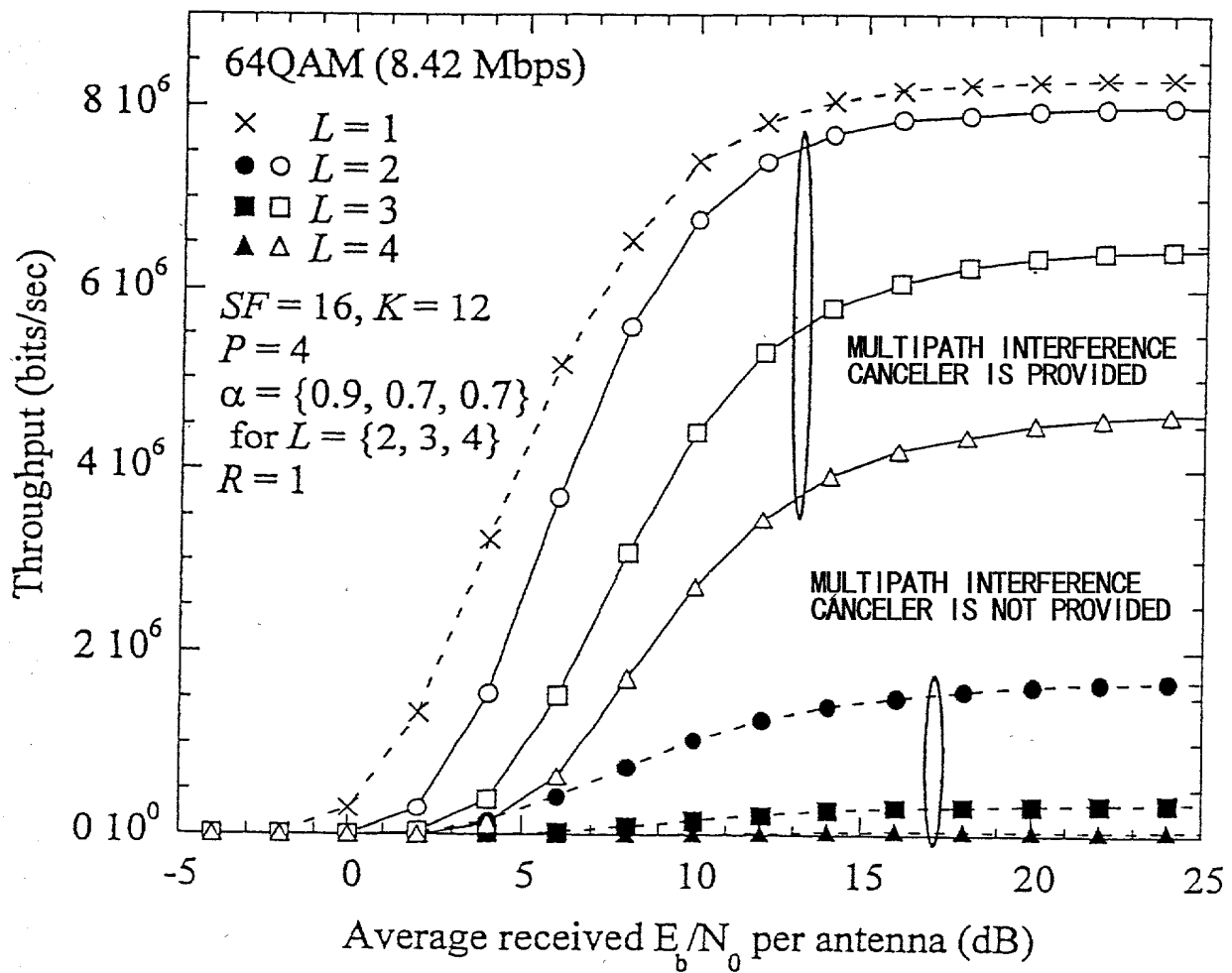


FIG. 11

Chip rate	3.84 Mcps
Symbol rate	240 ksps
Information bit rate	8.42 Mbps
Spreading factor (SF)	16
Number of multicode	12
Spreading code	Chanelization code
	Tree-structured orthogonal sequences
Modulation	Scrambling code
	Truncated Gold sequence
	64QAM
Channel coding / decoding	Spreading
	QPSK
Convolutional coding (Rate=1/2, $k=9$ ) / Soft decision Viterbi decoding	
Antenna diversity	2-branch
Channel model	$L$ -path Rayleigh $f_D = 80$ Hz